



**National  
Transportation  
Safety Board**

# Good Sleep Enhances Transportation Safety: Risks, Progress, and Gaps

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Board Member

Sleep Health & Safety 2013  
National Sleep Foundation  
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# Federal Agencies: Transportation

NTSB

FMCSA

FRA

NHTSA

PHMSA

DOT

MARAD

FTA

FHWA

FAA



NTSB



- 1) determining the probable cause of transportation accidents**
- 2) making recommendations to prevent their recurrence**

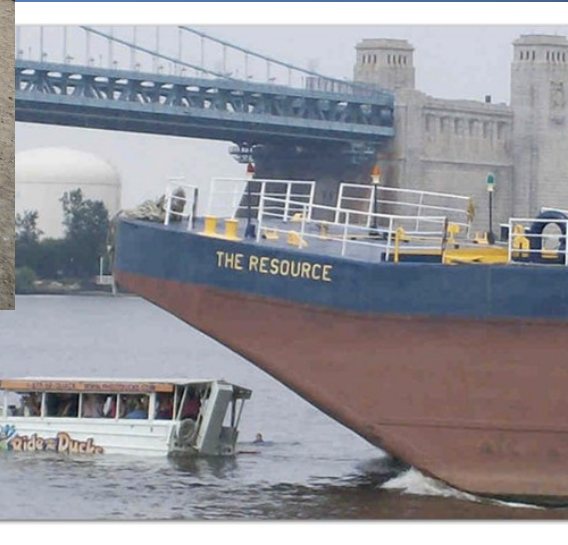


**NTSB**





# All Modes



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# NTSB Characterized as:

‘moral compass and industry conscience’

NTSB Chairman Deborah A.P. Hersman



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# Risks





# Challenges of a 24/7 Society



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# Fatigue Risks

Fatigue can degrade  
every aspect of  
human capability.





# Four Fatigue Factors +

- Sleep loss
- Continuous hours of wakefulness
- Circadian/time of day
- Sleep disorders
- Other considerations



# Miami, Oklahoma (June 26, 2009)

- Initial minor accident (~1:13 pm)
  - blocked eastbound I-44
- 2008 Volvo truck-tractor (~1:19 pm)
  - refrigerated semitrailer
  - traveling eastbound on I-44
  - 69 mph with cruise control engaged
  - without slowing or braking collided into queue of slowing & stopped vehicles



# Fatigue Factors

- Off work for 3 weeks: day active/night sleep schedule
- 3am to 3pm shift work/drive schedule (since 1997)
- Early bedtime (2 hr phase advance in sleep time)
- Obtained min 3 hrs/max 5 hrs sleep prior to accident
- Subsequently diagnosed with mild sleep apnea





# Miami, OK (June 26, 2009)

10 fatalities  
3 serious injuries  
2 minor injuries  
5 no injuries



Source: Oklahoma State Police



# Probable Cause (fatigue)

“ . . . driver’s fatigue, caused by the combined effects of acute sleep loss, circadian disruption associated with his shift work schedule, and mild sleep apnea, which resulted in the driver’s failure to react to slowing and stopped traffic ahead by applying the brakes or performing any evasive maneuver to avoid colliding with the traffic queue. . . . ”





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## **Track Path Animation**

Collision Between Two BNSF Railway Freight Trains

Red Oak, Iowa

April 17, 2011

DCA11FR002



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# Probable Cause (fatigue)

“ . . . failure of the crew of the striking train to comply with the signal indication requiring them to operate in accordance with restricted speed requirements and stop short of the standing train because they had fallen asleep due to fatigue resulting from their irregular work schedules and their medical conditions.”





# Fatigue in Transportation: NTSB Investigations and Recommendations



Barry Strauch, Ph.D.  
Office of Marine Safety



Jana Price, Ph.D.  
Office of Highway Safety



William Bramble, Ph.D.  
Office of Aviation Safety



# Progress



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### MOST WANTED LIST

A program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives. The following are ten of the current issues.



Addressing Human  
Fatigue



General Aviation  
Safety



Safety Management  
Systems



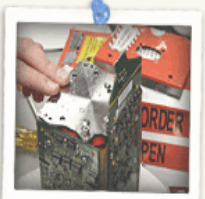
Runway Safety



Bus Occupant Safety



Pilot & Air Traffic  
Controller  
Professionalism



Recorders



Teen Driver Safety



Addressing Alcohol-  
Impaired Driving



Motorcycle Safety



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# NTSB Safety Recommendations: Fatigue

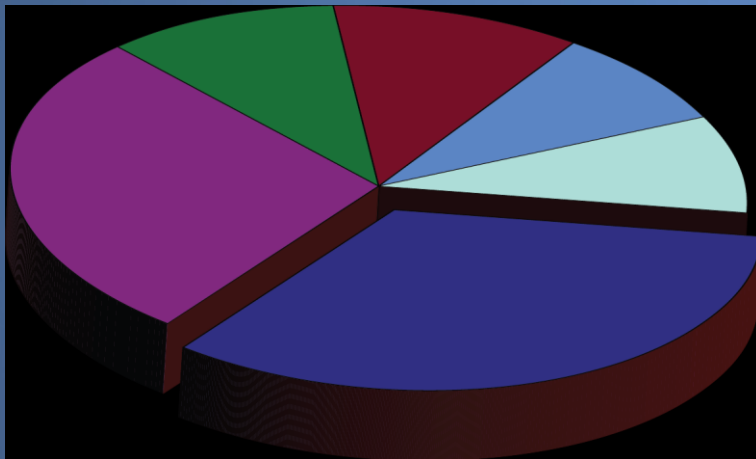
- MOST WANTED 1990 - 2012
- ~200 fatigue recommendations





# Complex Issue:

## Requires Multiple Solutions



- Scheduling Policies and Practices
- Education/Awareness
- Organizational Strategies
- Healthy Sleep
- Vehicle and Environmental Strategies
- Research and Evaluation

# New Hours of Service Regulations In 2011: Rail, Aviation, and Trucking

- Education activities
- Sleep apnea programs
- Fatigue Risk Management

Acknowledgment to action



# Fatigue in Transportation: NTSB Investigations and Recommendations



Jeff Marcus  
Office of Safety Recommendations



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# Gaps





# NTSB Safety Recommendations: Fatigue

- 40 years ago: May 10, 1972
- “Revise FAR 135 to provide adequate flight and duty time limitations.” (A-72-55)
- Classified “Closed-Unacceptable”



# Need More . . .

- Closed NTSB recommendations
- Education: everyone
- Data: operationally relevant
- Tested, effective strategies
- Strong, consistent policies
- Acknowledgment: risks
- Action!



Honorable John K. Lauber:

No Accident  $\neq$   
Safe Operation



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# Be a Change Agent . . .

Educate

Challenge

Model

Personal, family, work



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Good sleep, safe travels.



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# National Transportation Safety Board